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The structure of the Shura-Ozen' river valley nearby the sarykum aeolian-accumulative complex (Republic of Dagestan, Southern Russia)

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Abstract

© 2018 Russian Academy of Sciences. The Shura-Ozen' River originales in the low mountains of the northeast of the Great Caucasus and flows into the Caspian Sea in the north of the city of Makhachkala (Republic of Dagestan, Russia). The paper presents the results of its geomorphological study based on grain size and mineralogical analyzes, and geologicalgeophysical profiling. The study area is located near the aeolian-accumulative complex Sarykum, which is one of the largest isolated (i.e., formed away from deserts) aeolian sandy landforms in Eurasia. There are two principal groups of terraces differed sharply by their structure. The first group is presented by the floodplain and the high (V and VI) terraces, which are composed by overbank and riverbed alluvial facies with normal thickness. The second group unites the terraces I, III and IV characterized by much higher thickness of alluvial overbank sands, evident especially in the terrace IV. The formation time of Terrace VI occurred before the Atelian regression (i.e. presumably in Late Girkan epoch (?), more than 44-41 cal.ka BP), Terrace V - in Early Khvalynian epoch (app. 40-33 cal.ka BP). Terrace IV formation coincided the Mid Khvalynian epoch (app. 33 - (25)20 cal.ka BP), between the two deep incisions of the river correlated with the El'ton and Enotaev regressions of the palaeo-Caspian Sea. Terrace III formation occurred in Late Khvalynian epoch (app. (25)20-12 cal.ka BP), between the Enotaev and Mangyshlak regressions. All lower terraces and flood-plain of the river valley are dated to the Holocene. Consequently, it could preliminarily be assumed that the Shura-Ozen' River valley formation in its present form, as well as formation of the Sarykum sands originated from proluvial-deltaic deposits, occurred more than 44-41 cal.ka BP. (or 41-37 ka BP). Analysis of granulometric spectra of the alluvial sediments made it possible to draw an important conclusion that the most active phase of dune formation within the aeolian-accumulative complex Sarykum took place in the epoch preceding the formation of the river terraces, i.e. after the formation of proluvial-deltaic sands, but before the valley formation. It is also assumed that the relic marine sandy spits and the pebble coastal bar (to the north of Sarykum) are genetically linked with the alluvial deposits of the terrace III and the terrace V, respectively.

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Keywords

Alluvium, Caspian Sea, Floodplain, Grain size consist, Holocene, Khvalynian epoch, Mineralogical composition, Palaeoincision, River terrace

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